

**Abstract of the Disclosure**

The gain control circuit controls the amplification ratio of EDFA based on the results of having measured the input power monitor which monitors the EDFA input optical level which amplifies light and of having measured the output power monitor which monitors the output optical level. The optical pre-amplifier receives a notice of the number of wavelengths from a fore node and a notice of whether the optical post-amplifier of a fore node is in normal operation by a supervisory control signal, and changes over the gain control circuit to either the ALC or AGC mode. When the number of wavelengths changes while the optical pre-amplifier is operating in the ALC mode, the optical pre-amplifier is controlled in the AGC mode using the backed-up amplifier gain. Also, the gain value when the optical pre-amplifier is in routine operation is backed up in an amplifier gain back-up unit and an back-up unit.